Hogan Lovells

Contracting structures and risk allocation in offshore wind projects in Asia

April 2018

"They have a great attitude to client service; it feels more attentive and personalised than with some other firms."

Chambers & Partners Asia Pacific, 2017

Introduction

Wind energy has been used by mankind for centuries to grind grain, pump water and put sails into the wind. In modern times, wind energy is now also used to generate electricity in wind farms, and is globally growing in popularity.

Broadly, wind farms can be classified into onshore (land-based) and offshore (water-based, be it sea or freshwater). Onshore wind farms tend to be cheaper in cost, however they may be viewed as sources of noise pollution or considered to be less aesthetic additions to the landscape. On the other hand, offshore wind farms tend to intrude less on the environment and social communities. They can also generate more energy if they are far out at sea. However, they carry with them a higher price tag.

Many developers, investors and contractors in the offshore wind industry have learned expensive lessons over last few years. Construction risk in offshore projects includes the usual suspects such as delays, cost overruns and lack of quality. However, the consequences are magnified due to the cost of offshore logistics and technology. Many of those expensive lessons were quickly translated into amended designs, method statements, structural changes and new contract clauses. The learning curve was steep. As of today, as the industry has matured and the number of suppliers and contractors is consolidating, construction risk financing capacity has become available in all jurisdictions.

While Europe has typically been the region for offshore wind developments, the offshore wind industry is steadily growing in Asia. The appetite has been fuelled by a desire to diversify energy sources, tap on renewable energy as well as a reduction in costs. While China is currently taking the lead in offshore wind developments in Asia, other Asian countries such as Taiwan and Korea are also exploring this area with much interest.

When developing an offshore wind farm the contractual set up needs to reflect the requirements of the envisaged financing structure from early in the process. The requirements of investors and financiers are predictable and can be prepared for early on.

This booklet aims to give a snapshot view over typical offshore wind project contracting topics and actual market standards as of the beginning of 2018 which will need to be considered and implemented in any offshore wind contracting, irrespective of the starting point.

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Asia Offshore Wind Energy Market

Wind opportunities are growing in Asia, particularly in East Asia, backed by a desire to diversify energy sources, increase the renewable energy portfolio and reduction in costs. While most existing installations in Asia are onshore wind farms, the appetite for offshore wind installations is growing and there is much potential for expansion.

We set out below a brief update on the status of the offshore wind market in certain key Asian jurisdictions, with particular focus on Taiwan which we see as a key growth area for offshore wind projects. The update will then be followed by a detailed look at typical offshore wind project contracting topics.

Please feel free to contact us should you have any queries.

Taiwan

Geographical edge

Taiwan's geography gives it an added edge in harnessing wind energy. It is an island blessed with strong wind speeds which result in full-load hours of up to 3500-4300 per year, significantly more than the 2,200 hours benchmark in Europe[1]. In particular, there is a channelling effect of offshore wind due to the hugging of the east of the Taiwan Strait by the Central Mountain Range and the Wuyi Mountains.

Regulatory support

It is therefore not surprising that the Taiwanese government has been very encouraging of the wind industry. Supporting legislation such as the Electricity Act and the Renewable Energy Development Act is in place, allowing renewable energy companies to sell electricity through wholesale, wheeling or direct sales, and establishing feed-in tariff rates and tariff setting methods.

In 2012, the Ministry of Economic Affairs launched the Thousand Wind Turbines Project, under which a mandate was given to complete the installation of 2 offshore wind pilot projects by 2016. The mandate has since been extended to achieve a total of 5.5GW of offshore wind installation by 2025. Broadly, the overall policy direction is to gradually phase out nuclear power plants and have an energy mix of approximately 50% natural gas, 30% coal and 20% renewable energy by 2025[2].

Approval process

Overall, although Taiwan is a smaller market than China, the market is perceived to be more open and welcoming to foreign expertise. The approval process is also fairly clear and established. In the context of offshore wind farm projects, the standard process is as follows:

a) Obtaining environmental impact assessment clearance

b) Obtaining an Establishment Permit

c) Obtaining Bureau of Energy recognition

d) Entering into a PPA with Taipower, a government-owned power entity

e) Obtaining a Construction Permit

f) Obtaining an Electricity Licence

The time required to obtain each relevant permit is roughly two to three months from the time of application.

Grid allocation process

The Bureau of Energy ("**BOE**") published the Guidelines for Grid Allocation dated 18 January 2018 to set out the grid allocation process in respect of offshore wind energy.

The grid allocation process is divided into 2 phases as follows:

1 Flanders Investment and Trade, "The Offshore Wind Market", retrieved 24 April 2018 - https://www.flandersinvestmentandtrade.com/export/sites/trade/files/market_studies/The%20Offshore%20Wind%20market_Taiwan_2017.pdf

2 offshoreWIND.biz, 15 February, 2017, "Taiwan Reaffirms 20%-by-2025 Renewable Energy Target", retrieved 24 April 2018 - https://www.offshorewind.biz/2017/02/15/taiwanreaffirms-20-by-2025-renewable-energy-target/

Phase 1: Selection Process

* The BOE will allocate 3.5GW out of the target of 5.5GW of capacity under the Selection Process for projects which must be operational from 2020 to 2025.

* Main criteria considered at the Selection Process include: construction capability, engineering design capability, O&M capability and financial capability. Local content is also an important factor and is discussed in further detail below.

* The allocation is expected to be announced in late April / early May 2018. Awarded bids will benefit from a fixed feed-in tariff.

Phase 2: Auction Process

* The remaining 2GW of capacity will be allocated through the Auction Process, i.e. bidders will participate in a competitive tender by offering a price which is lower than the fixed feed-in tariff.

* Assessment at the Selection Process is not completely irrelevant. A minimum score of 60 points at Phase 1 is required in order to be eligible for participation in Phase 2.

Other issues

PPA – As described in "Approval process", the developer is required to enter into a PPA with Taipower, a government-owned power entity. The PPA for offshore wind projects (published 1 December 2017) is in a standard form, and some key terms which may be of concern to developers include:

a) Payment to the developer will be limited to the amount of electricity actually taken by Taipower

b) The right of Taipower to unilaterally decrease the amount of electricity to be offtaken without any compensation to the developer

c) No developer right to terminate for a Taipower default

d) No government guarantee

e) No lender step-in rights

The standard form is regarded by the BOE to be non-negotiable. Having said that, the list above reveals potential bankability issues and the interaction between the BOE and market forces is a key area to look out for in the upcoming years.

Foreign investment – There are no foreign ownership restrictions applicable to the offshore wind sector. Foreign investors can participate in the Taiwanese offshore wind market by either acquiring shares in a Taiwanese company or by establishing a local company. Generally, the latter approach is favoured, with a project company being established for each endeavour. In either case, foreign investment approval from the Investment Commission of the Ministry of Economic Affairs is required ("**IC**").

There are presently foreign exchange controls in Taiwan restricting the inflow/outflow of funds. As a general rule of thumb, foreign investment approval from the IC is required for investment flowing into Taiwan. For funds flowing out of Taiwan, prior approval of the Central Bank of Taiwan is required in respect of a transfer of an aggregate sum in excess of USD50 million, while approval of the IC is required in respect of a single transaction in excess of USD50 million.

Import and export permits are required; however in the context of offshore wind projects, the import of turbines and other construction/operation machinery may be exempted from import tariffs if such items cannot be sourced for domestically.

Local content – The government is keen to develop Taiwanese capabilities in respect of the offshore wind industry, and is keen to see the transfer of knowhow and expertise to locals. Local content considerations factor in assessment of a developer's engineering design, operations and maintenance and financial capabilities for developer selection under Phase 1 of the Guidelines for Grid Allocation published by the Bureau of Energy in 18 January 2018.

Conclusion

Although the Taiwanese onshore wind market is relatively mature, the offshore wind market is presently at a fledging stage and there are many potential growth opportunities. In addition, onshore wind farms are limited by land constraints (of which the availability is decreasing in Taiwan) as opposed to offshore wind farms. All in all, we see a window of opportunity for industry players wanting to get a strategic foothold in the market

South Korea

Compared to other Asian nations, the wind energy industry in South Korea is relatively in its infancy - installed capacity of wind power only passed 1GW in 2016.

Having said that, there is a strengthening desire to reduce dependence on fossil fuels, and the general tenor of the government towards renewable energy has been supportive and positive. Recently, the Ministry of Trade Industry and Energy announced plans to increase the country's renewable energy capacity by 2030, mainly through wind and solar energy. The increase would result in renewable energy representing roughly 33% of South Korea's current electricity-generating installed capacity, up from roughly 10% at present[3]. The Korean Wind Energy Industry Association also signed an agreement with the World Wind Energy Association in August last year to identify policies for promoting wind power and accelerating the development of wind farms[4].

One of the traditional challenges faced by the wind industry in South Korea is the lack of land. Most of South Korea's terrain comprises of wood mountains (which is not suitable for wind farms) and farm lands (which naturally invoke some level of public hostility). However, this may be seen as an impetus for offshore wind development. Indeed, in November last year, the world's ninth-largest wind power farm was opened in Jeju, Korea and it was offshore in nature – the Tamra Offshore Wind Farm. In fact, the Jeju local government has officially partnered with the LG Group with the aim of powering the island entirely by renewable energy by 2030, and aims to build five more offshore wind farms by 2022[5]. Another flagship government offshore wind project in the making is the Southwest Offshore Wind Project to be located in the Yellow Sea (southwest of Seoul) and developed by the state-owned Korean Offshore Wind Power[6].

In South Korea, we see that momentum is gaining in favour of wind energy and between onshore and offshore wind projects, the latter shows great potential for overcoming land challenges in South Korea.

3 Wind Power Monthly, 19 December 2017, "South Korea targets 58.5GW wind and solar by 2030", retrieved 24 April 2018 - https://www.windpower-monthly.com/article/1453151/south-ko-rea-targets-585gw-wind-solar-2030

4 offshoreWIND.biz, 9 August, 2017, "Korea Readies-for Wind Expansion", retrieved 24 April 2018 - https://www.offshorewind.biz/2017/08/09/ko-reareadies-for-wind-expansion/

5 The Maritime Executive, 20 June 2017, "South Korea Moving from Nuclear to Renewables", retrieved 24 April 2018 - https://www.maritimeex-ecutive.com/article/south-korea-mov-ing-fromnuclear-to-renewables#gs.BIlaOxo

6 offshoreWIND.biz, 6 November, 2017, "Doosan to Deploy 5.5MW Turbines at Korea's Southwest Project", retrieved 24 April 2018 - https://www.off-shorewind.biz/2017/11/06/doosanto-de-ploy-5-5mw-turbines-at-koreas-southwestproject/

China

China has a significant wind power capacity with more than 92,000 wind turbines. China is also presently leading offshore wind development in Asia. Between 2017 and 2026, China has plans to install 13GW of offshore capacity.

One of the key challenges in the Chinese wind market is the integration of the onshore wind farms which are mostly in the Northern and Western regions with the Eastern regions where China's greatest electricity demand is and the most prosperous cities are. For that reason, China is looking more and more towards building offshore wind farms on the east coast where there are large shallow areas of sea. One notable offshore wind project in progress is the 800 MW Yancheng Wind project, which will become the world's largest offshore wind farm when completed[7]. China is also looking overseas, and one firm (Sinomec) recently announced its intention to invest in an offshore wind power project in the Russian White Sea[8].

Japan

After the Fukushima nuclear accident, the Japanese government looked towards fossil fuel imports, causing an increase in electricity prices and a greater dependency on imports. The energy policy has changed in recent years in a bid to reduce such a dependency, and the METI's base case energy mix is to increase renewables from 10% to 22-24% of the energy pie[9].

There is significant opportunity for the development of offshore wind industry in Japan, being an island-nation. Typically, onshore wind development has faced challenges in obtaining approvals given land limitations. However, such land approval issues are less of a concern for offshore wind farms. Further, the government has shown its support by increasing the offshore wind FITs and using JETRO to woo foreign investors. Recently, the Japanese government has also announced the submission of a bill which will create special zones for promoting offshore wind power generation, giving operators the right to generate offshore wind power for 30 years[10].

7 China Daily, 13 April 2014, "Chinese energy giant on track to build world's largest offshore wind farm", retrieved 24 April 2018 - http://www.chinadaily.com.cn/business/2017-04/13/content_28909941.htm

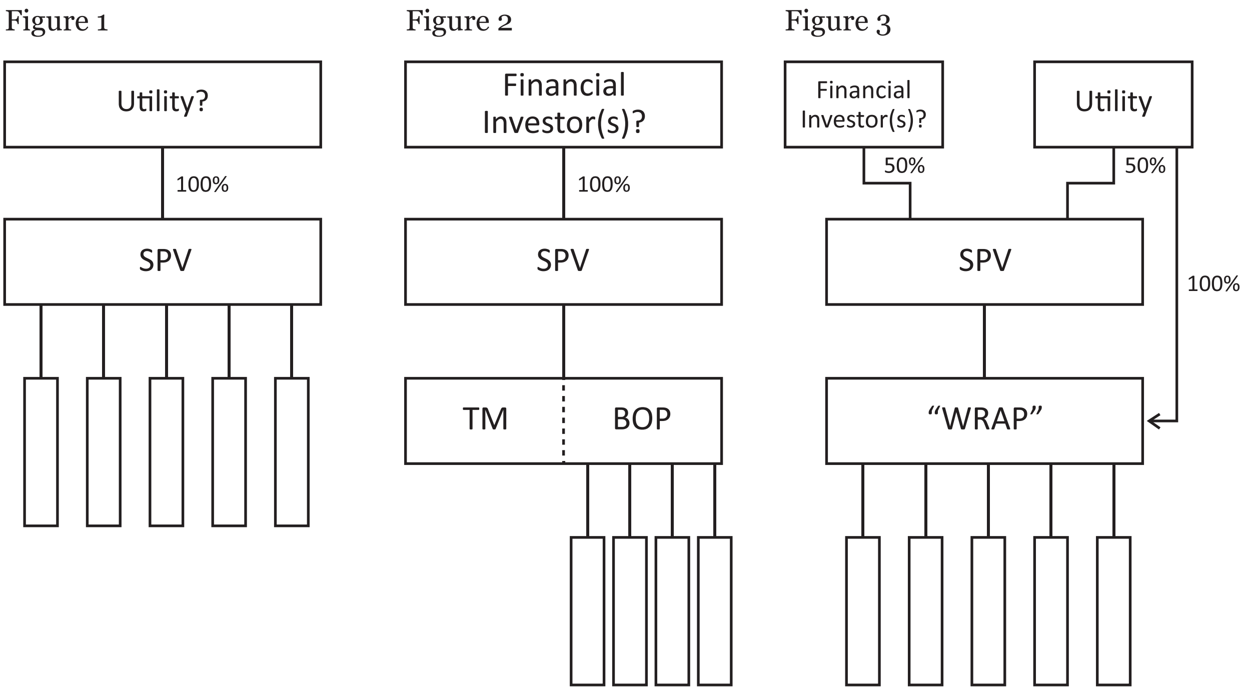
8 Asia Times, 2 February 2018, "China keen on investing in offshore wind power park in Russia's Arctic region", retrieved 24 April 2018 - http://www.atimes.com/article/china-keeninvesting-offshore-wind-power-park-russias-arcticregion/

9 Ministry for Economy, Trade and Industry (METI),Japan's Electricity Market Reform and Beyond, July 7, 2015

10 Wind Power Offshore, 16 March 2018, "Japanesegovernment to decide offshore plan", retrieved 24 April 2018 - https://www.windpoweroffshore.com/article/1459682/japanese-government-decide-offshore-plan

Procurement structures in offshore wind

The below chart illustrated typical offshore wind contracting structures:



a) Multi-contracting (each lot and procurement and installation separate; see Figure 1 above)

Multi contracting retains a significant amount of construction risk with the employer but requires a big and experienced project management team. It is typically only chosen by utilities. This structure is not the first choice for limited recourse construction financing.

b) Multi-contracting with a combination of procurement and installation 1 (see Figure 1 above)

This structure also retains a significant amount of construction risk with the employer and requires a big and experienced project management team.

c) Turbine delivery onshore and Balance of Plant ("**BoP**")[11] general contractor (see Figure 2 above)

This structure shifts a lot of the interface risk down to the BoP contractor but gives the employer less control over project execution. This is a typical structure for projects primarily owned by financial investors.

d) 'Wrapped' multi contracting (see Figure 3 above)

This allows for a very custom-tailored risk allocation between the SPV and the EPC general contractor.

It is very suitable for financial investors and an experienced developer with significant financial and technical resources.

11 Balance of Plant is a term generally used in the context of power engineering to refer to all of the supporting components and auxiliary systems of a power plant needed to deliver the energy, other than the generating unit itself. In offshore wind this includes array cables, foundations and the offshore substation.

General offshore wind contracting topics

Interfaces

The employer is generally liable for managing the interface between the different contractors, the certifier, the grid operator and the permitting authorities. Successful interface management is one of the key issues in offshore wind projects. Interface risk primarily means the risk of one contractor being disrupted by delayed or poor performance of another contractor or poor interface management of the employer. From the employer's perspective, the extent of interface risk inherent in a project depends on the chosen contracting strategy: the more lots, the more interface risk. However, irrespective of the structure, the issues remain the same. Interfaces need to be managed primarily in relation to scope, design, programme, execution and dispute resolution.

a) Scope

In order to ensure an exact and suitable scope split between the different contractors, the grid operator and further participants detailed scope split matrixes are used.

The employer should further seek to implement matching boilerplate clauses into each of the contracts (in relation to project management rights, quality control, insurance, warranty, applicable law, documentation, dispute resolution and so forth).

In cases where the ultimate scope cannot be finalized at the contracting stage, the employer should seek to include suitable coordination and turnkey responsibilities into the relevant contracts, coupled with assumptions and the right of the contractor to claim additional time and cost should the final requirements deviate from such contract assumptions.

Contractors will also be required to provide documents for certification. Contractors should provide all documents required by the certifier for certification purposes even if the exact content and structure of such documents remains unclear at contracting stage.

b) Design

The design of the works often needs to be developed, and interfaces cleared, prior to the execution or effectiveness of the final agreements. In this phase, design works are often done on the basis of early works and reservation agreements.

In a first step the employer needs to ensure that all lots are based on the applicable norms and standards, and that all lots have the same design lifetime. This includes the early definition of the applicable grid and certification requirements and the passing down of these requirements to the relevant contractors.

The design of interface relevant parts of the works needs to be closely coordinated. For example, the wind turbine generator ("**WTG**") contractor will need to issue rele-

vant load data to the foundation contractor via the employer, and further requirements in relation to the foundations. The employer will require the WTG contractor to review the relevant design documents of the foundation contractor and confirm that the interface data was correctly implemented by the foundation contractor.

Liability in case of mistakes is typically heavily debated. A market standard solution would be as follows:

- If contractor A provides incorrect relevant information that relates to interface to the employer, like load data in relation to the wind turbines, contractor A should be obliged to indemnify the employer against the cost and loss incurred, up to a certain sub-cap to be agreed. Such cost and loss can include the additional costs incurred by contractor B who, as a consequence of the mistake, had to redesign the foundations.
- If contractor A overlooks mistakes that are relevant to interface in design documents issued by contractor B, contractor A is not entitled to claim time and cost if, as a consequence, contractor A gets disrupted in the further course of the works. Only contractor B is liable to indemnify the employer against the cost and loss incurred as a consequence of the mistake, because contractor B made the mistake in the first place.

c) Programming

From a programming perspective it is important to identify interface relevant milestones of different works packages early on, to define such milestones, eventually penalize such milestones and to implement buffers, if possible, in case of delays. Buffers can include time gaps until the planned start of the next critical activity. Buffers can also include the assembly of a certain stock e.g. of WTGs at the quayside ready to being loaded out before the actual start of installation works. If a stock of WTGs is available, the risk of an installation vessel being idle because of a delayed delivery of wind turbines is mitigated.

Another important aspect is the definition of binding document review times and of a working document control, data exchange and production system for the entire project.

The employer should furthermore retain an explicit right to reschedule, suspend or instruct acceleration of works or installation sequence in order to be able to react in case of unforeseen difficulties.

d) Execution

Contractors need to commit to suitable and matching method statements.

The employer (including financing banks and their advisors) must be entitled to witness production of the work and to inspect production process at the sites of suppliers and subcontractors of various tiers.

The right of contractors to suspend the works in case of disputes on payments should be excluded or suitably restricted.

The risk of one contractor impeding another contractor in the execution phase must be mitigated. For example, if contractor A impedes contractor B, and contract B incurs additional cost, contractor A should undertake vis-à-vis the employer to indemnify the employer from claims for additional cost of contractor B. This would also include exceeding of agreed cycle times if e.g. WTG contractor and installation contractor are using the same WTG installation vessel for their respective scopes. The definition of the consequences of such impediments needs to include the consequential adverse weather which can be a consequence of such delays.

e) Dispute resolution

In order to mitigate interfaces in dispute resolution each contract should be based on the same applicable law, contain the same dispute resolution clause and suitable third party notice and joinder procedures.

Design Risk

The contractor typically bears the risk that his design is fit for the defined purpose of the works.

Site Risk

The employer typically provides relevant representative site data. The contractor would confirm the completeness of such data and assume interpretation risk.

The employer would bear the risk of deviations between data provided and actual conditions, but only beyond certain thresholds.

Weather risk

a) Weather risk means the risk of offshore works not being possible because the weather conditions (wind, wave height, current or visibility) being beyond the operating conditions of the used vessels and equipment ("**Adverse Weather**").

b) A robust project programme should always include statistical Adverse Weather plus a certain margin (i.e. include float for Adverse Weather). Banks usually require a P90 programme which means that the risk of more Adverse Weather should not exceed 10% statistically.

c) The allocation of weather risk between employer and contractors is very project specific. Prices can include from zero days of Adverse Weather ("**P0**") up to every possible day of Adverse Weather ("**P100**"). If the employer retains weather risk, the exact Adverse Weather criteria, methodologies of determining whether the criteria are exceeded need to be defined (e.g. "**captain's decision**" versus measured and proven excess of defined data at a

certain location).

d) The contract should differentiate between aborting an operation (because of actual Adverse Weather) and not starting an operation (because no sufficient weather window is forecasted) and the relevant criteria and consequences.

e) The contract should differentiate between net and gross adverse weather downtime, the latter being the time period which expresses the actual project delay caused by Adverse Weather (including eventual time required for de- and remobilization).

f) The contract should define the interface between Adverse Weather on one hand and force majeure (which usually includes exceptionally bad weather) on the other hand.

g) The risk of consequential Adverse Weather needs to be dealt with adequately. Consequential bad weather is the additional Adverse Weather a party can be confronted with because for some reason the works of such party were delayed into a period with more Adverse Weather than in the period during which such works were originally scheduled.

Installation and offshore logistics

Vessels and offshore installation tools are an expensive and often scarce resource. The employer therefore needs to ensure that these resources are used efficiently, and that adequate protection is available.

The employer will typically be responsible for the marine coordination (unless this task is assumed by a BoP contractor).

The parties need to agree on a so-called latest vessel availability date: Until which date must the relevant installation be available as a minimum, if – for a reason attributable to the employer – the vessel is needed longer than scheduled? And who is responsible for the relevant additional cost, especially if certain delays were also caused by the contractor providing the vessel?

In order to exactly ascertain responsibilities for delays in the use of expensive installation vessels "**chess clock mechanisms**" are usually used, which allow parties to exactly determine if a party has exceeded aggregate budgeted cycle times or not, and to which extent with which consequences, including consequential Adverse Weather.

Contractors typically have an interest in being entitled to replace agreed spread by at least equivalent or better equipment. The contract should also provide for a mechanism to adjust the definition of “**bad weather**” or any "**reasonable endeavour criteria**" (see page 20) in this case.

Subcontractors and subcontractor control

Employers usually wish to retain control over the identity of subcontractors or suppliers used by contractors. This specifically applies to offshore wind projects, because the identity and track record of a contractor plays a significant role in the evaluation of the project.

As a consequence, subcontracting is usually only permissible with the prior written consent of the employer, unless the subcontractor or supplier is chosen from a pre agreed "**white list**", or the subcontract is of an immaterial character only.

Equipment and equipment control

Offshore installation vessels and tools are not off the shelf products but typically unique or of a specialist nature. Entire installation concepts and programmes, certification and technical due diligence are often based on the planned use of such a special vessel or tool.

As a consequence, the use of such special vessel or tool is usually pre-agreed in installation contracts, and the rights of a contractor to use another vessel or tool, or to withdraw the vessel or tool, are restricted.

Change in laws, technical norms and standards, and public permits

The risk of changes after a base date to be defined is typically with the employer, eventually subject to the non-foreseeability of such changes.

If final public permits, grid requirements or similar are not available at contract signing, the contract is typically based on assumptions, and the risk of the assumptions being incorrect lies with the employer.

Transfer of title

There may be a legal dispute over which law a transfer of title would fall under if such transfer occurred offshore. As a consequence it is rather standard practice that title to all elements of an offshore wind farm transfers to the employer at the latest when the relevant installation vessel leaves the quayside.

This requirement is a bankability topic and triggers typically discussions about payment schedule and timing and payment security. It can also have tax implications.

Customs

Usually contract prices are inclusive of all relevant export and import duties, customs and similar fees.

Contractors should be responsible for handling all required customs procedures but this must be dealt with in detail in the contract.

New technology

Offshore wind technology is still a relatively young technology, and often at least some elements of an offshore wind farm including its grid connection contain either new technology or proven technology in a novel application. In each case investors and banks might require certain additional protection against the risks stemming from such novelties. This can typically include:

a) Control and information rights of the employer;

b) Penalization of interim milestones;

c) Extension of warranty periods;

d) Higher liability caps;

e) Special availability guarantees including liability for loss of use;

f) Extended serial defects clause;

g) Rejection rights; and

h) Securities.

Liability and limitations of liabilities

Liability in offshore wind contracts is typically restricted and limited in the overall amount. As a general rule, liability for loss of profit, loss of use and similar types of pure financial loss is excluded, save for the usual carve outs.

The overall maximum liability is often restricted to amounts between 30 and 100% of the contract price. It depends, however, on the type of contract as to what the usual threshold is. Supply agreements, especially turbine supply agreements, have limitations in the range of 100%, installation and/or BoP contracts in the range of 30-40%.

Another crucial question whether if the costs for remedying defects are included in the overall limitation of liability or not. The usual expectation of an employer is that they are not. If they are included, the usual expectation is that the cap must be sufficiently high in order to allow for a full replacement of the works in case of a major / serial defect.

It is furthermore standard to agree on subcaps for certain defined liabilities such as delay and performance liquidated damages, and certain special indemnities or damage obligations.

Damage and contractual breach are often caused by employees of a party, or other contractors / subcontractors to such party. If the relevant breach constitutes a tort from a legal perspective, such employee or other contractor can be subject to a direct personal liability towards the affected party. Such liability can practically undermine the agreed limitation of liability. It is therefore important to extent the benefit of such limitations of liability to employees and subcontractors.

LLMC: In this context, another rather crucial point is the applicability of special legal limitations of liability for maritime claims which could be implied in offshore wind contracts, and which can cut across contractually agreed levels of limitation of liability. The possible applicability of such limitations must be assessed (e.g. LLMC or country specific maritime and transport law).

Knock-for-knock: Contracts relating to offshore works involving vessels sometime contain a special 'knock-for-knock' liability regime. BIMCO and LOGIC contracts are based on such liability regime which is standard in the oil & gas offshore industry.

Knock-for-knock provisions are insurance driven and a consequence of a certain insurance structure. Under general rules of law, a party acting negligently would be obliged to indemnify the other party for any damage caused by such negligent behaviour. Especially in an offshore context, the respective liabilities will be frequently complex and contentious, e.g. in relation to causation and contributory negligence. Knock-for-knock provisions allocate the risk of damage to property and personal injury to the party who suffered such loss or injury, regardless of who actually caused the damage, loss or injury. This means that even if the employer, by its own negligent behaviour, caused damage to the property of the contractor, this damage would have to be borne by the contractor. Each party can take out insurance against such damage and is thus protected. The overall insurance costs are typically minimised because the two parties do not need to insure against the same potential risks and liabilities. Lengthy and costly disputes about legal responsibilities are avoided. Knock-for-knock liability regimes are structured by way of reciprocal indemnity obligations. Each party undertakes to hold the counterparty harmless from any claims for damages such counterparty may face on the grounds of having caused damage to any property or bodily injury to the respective other party or to any member of the respective other party's group. Employees and subcontractors are typically included in such indemnity provisions.

Taking over

Taking over concepts depend in the first place from the general contracting approach. But typically in each case the following issues will be considered:

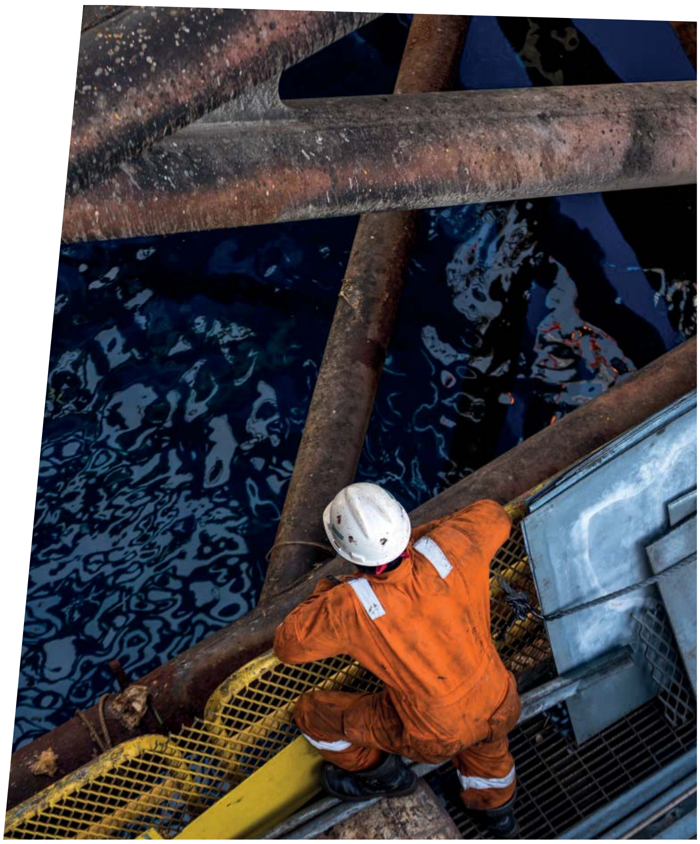
a) Taking over after completion of a lot only, or after certain batches or even single turbines?

b) Who is entitled to feed in revenues prior to taking over, and who is responsible for eventual service and maintenance cost?

c) Even if the warranty periods can start differently for each lot or batch or wind turbine, should warranty periods for easier administration end on the same day? This can be achieved by implementing an average taking over date concept.

d) Which tests required are in each case as a prerequisite for taking over, and what if such tests can, because of a delay by certain lots, only be carried out with delay?

e) Is there a deemed taking over after a certain long stop date if taking over cannot occur due to reasons attributable to the employer?



Warranty and warranty periods

Typical warranty periods in offshore projects are five years from taking over. Sometimes warranty periods or their length are linked to the existence of a service and maintenance agreement.

Depending on contracting/taking over structures, warranty periods for different items of plant (like WTGs) often end on the same date which is e.g. the average taking over date of all the WTGs plus five years, with a defined minimum duration of e.g. 48 months.

Repairs during warranty period typically trigger a new warranty for the repair, often of two years. The long stop date of warranty period is often 5 plus 2 years.

It normally needs to be discussed if and to which extent warranty periods can be abbreviated in case of voluntary suspension by the employer, or other material delays in taking over attributable to the employer.

A significant cost element in offshore warranty cases are the in-and-out cost, i.e. the logistics costs of dismantling a part offshore, transporting it onshore, and bringing it offshore again plus installing it. As a consequence, contractors sometimes seek to limit their exposure especially for in- and out costs, also depending on the available insurance cover (LEG 1 or 2 or LEG 3).

Serial defects

In most offshore wind contracts, especially in turbine supply agreements, serial defects clauses are standard and often a bankability requirement. Downtimes can be so costly that the preventive remediation of a possible future defect preventing a prolonged downtime is of significant importance.

Serial defects clauses can differ significantly in content and need to be looked at with great care.

It needs to be discussed if all defects or only defects of certain material components can trigger the consequences of the serial defects clause.

Typically, if a certain number of similar or same defects appear during a certain period, the contractor is obliged to carry out a root cause analysis and/or to examine a certain further number of items in order to assess if such items have the same defect.

If a root cause analysis establishes that the defects have the same root cause, all affected components must be exchanged even if a defect has not yet materialized.

The type and extent of involvement of the employer in the root cause analysis should be defined.

Sometimes the benchmark or trigger is not only defects in the relevant projects, but also defects in comparable models in the "**fleet**" of the relevant contractor.

Insurance

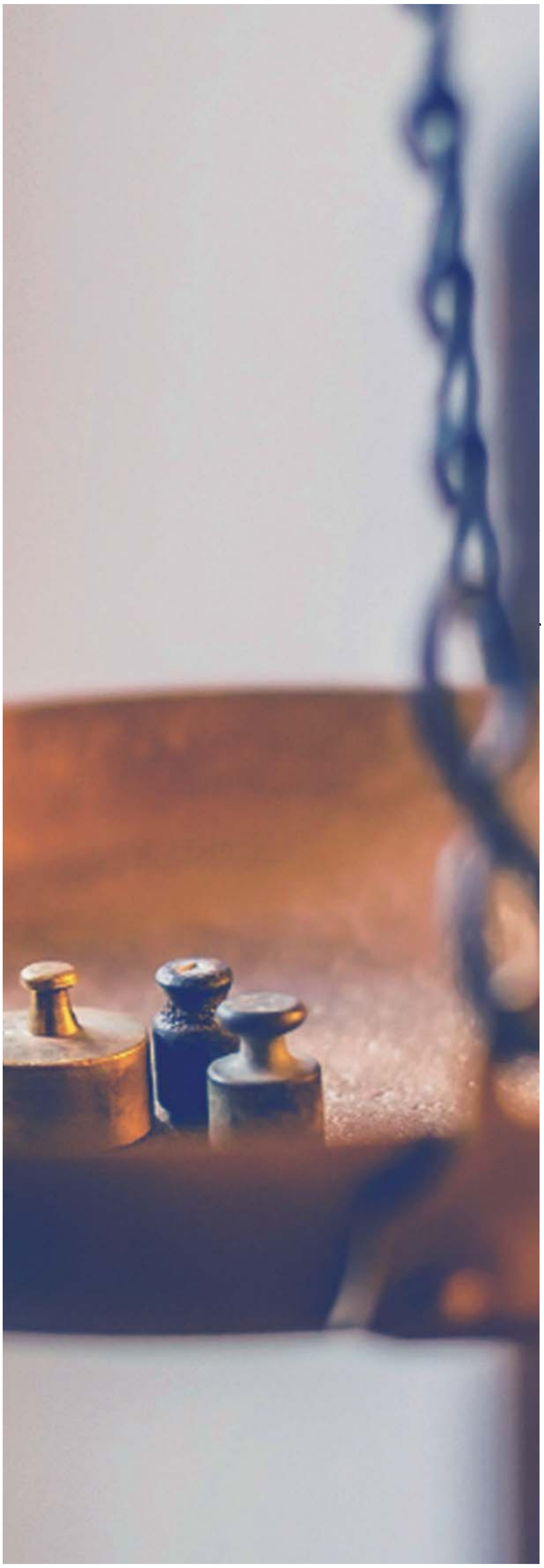
Offshore wind projects require the taking out of special offshore related insurances, and usually a custom tailored insurance package which must be very closely harmonized with the contractual framework. Offshore specific insurances include:

a) Protection and Indemnity (P&I) insurance, eventually including specialist operations coverage

b) Marine hull and machinery insurance; and

c) Charterer's liability insurance

Offshore projects furthermore require the use of a marine warranty surveyor ("**MWS**"). The MWS provides independent third-party technical review and approval of marine construction and transportation project operations, from the planning stages through to the physi-



cal execution. The MWS acts in the interest of the project insurers and usually needs to sign of method statements, equipment and the actual start of an operation as a prerequisite for such operation having actual insurance coverage.

From an employer's perspective it is important to require contractors to follow the instructions of the MWS. Contractors sometimes require protection against possible unreasonable or unforeseeable requirements of the MWS which can lead to significant delays. In this context it is often agreed that eventual unreasonable instructions of the MWS entitle the contractor to time and cost.

Bankability topics

As described in the beginning, the envisaged financing structure has a big influence on structure and content of the project agreements. Apart from general structural bankability requirements, the following topics should always be considered if limited recourse financing is envisaged at a certain point in time:

* Obligation of the contractors to provide legal opinions; and
* Obligation of the contractors to enable the employer to comply with all reporting and information requirements in the finance agreements including KYC and sanctions.

Wind turbines (TSA and SMA)

The "**WTG**" related contracts, the turbine supply agreement ("**TSA**") and turbine service and maintenance agreement ("**SMA**") are the key contracts in the context of the development of an offshore wind farm. The following list describes some typical relevant elements of these contracts.

Guarantees

a) A TSA usually contains a power curve guarantee and sometimes – even in offshore contracts – a noise guarantee, depending on permit requirements. In a power curve guarantee, the amount of electricity produced at a certain wind level and thus the electric efficiency of a turbine is guaranteed. In a noise guarantee, a maximum noise level is guaranteed. The breach of such guarantees triggers an obligation to rectify or to pay liquidated damages ("**LD**"), usually at the choice of the contractor. A usual performance LD cap would be 15% of the TSA contract price.

b) The availability guarantee is usually part of the SMA. Availability guarantees are either time or production based, with production based guarantees having become more market standard. Usually an availability guarantee relates to the yearly average of all WTGs in the wind farm. If agreed availability levels (today in a range of at least 95% post, and 90% pre taking over) are not met, liquidated damages become payable. The availability guarantee is usually capped at an amount that is a percentage of the total service fee under the SMA and/or the TSA contract price.

c) It has become market practice that a certain availability is already guaranteed in the phase between finalization of commissioning and taking over of the wind turbine, i.e. in a period when the SMA has not yet become functional. From a bankability perspective such early generation availability guarantees are recommendable if the funding sources are pre-completion revenues.

d) The availability guarantee is linked to the scope and on-going effectiveness of the SMA. Only if the contractor is responsible for scheduled and unscheduled maintenance he will be willing to agree to an availability guarantee.

e) Typically strongly debated are exclusions of the availability guarantee, i.e. the definition of events which, should they cause unavailability, do not trigger the availability guarantee. As a rule, contractors do not assume the risk of unavailability if this is caused for reasons outside their control.

f) Contractors should warrant the conformity to their WTGs with the applicable grid code which must be defined in the contract. The exact interface between the WTG / WTG contractor grid code warranty and the grid code conformity / warranty of the BoP works is typically a matter of debate. Grid codes sometimes require WTGs to have certain features which might require WTG manufactures to have certain IP rights or licenses. Grid code compliance can therefore trigger IP right issues.

Securities

a) It is market practice that the contractor provides an advance payment guarantee, a performance guarantee in an amount between 10 and 20% of the contract price, and a warranty guarantee in an amount between 5 and 10% of the contract price, usually payable upon first demand.

b) Since wind turbines are usually taken over one by one or in batches (and not in aggregate upon completion, commissioning and testing of the last wind turbines) the parties often discuss mechanisms aiming at a gradual phasing out of the performance guarantee against phasing in of the warranty guarantee.

c) The amounts of the guarantees are usually adapted in case the contract price increases beyond certain thresholds to be defined. The providers of the guarantees are required to have and maintain a certain minimum rating.

d) In addition to bank performance and warranty guarantees usually parent company guarantees of the ultimate parent of the turbine manufacturer are required.

Commissioning and early generation revenues

The commissioning procedure is usually defined in the employer requirements. Preliminary documentation and O&M manuals need to be provided prior to the commissioning. Wind turbines require electricity for the cold commissioning, and grid for the hot commissioning. Ideally, an onshore grid connection and electricity are available at the time of the cold commissioning of the first wind turbine. However, this might not be the case, so fall back solutions should be agreed at the contract stage (e.g. who would provide gensets? Would power from the offshore substation be available?).

Usually, from commissioning onwards, revenues are generated. These revenues are usually for the benefit of the Employer. The contractor often requires a certain compensation for service and maintenance prior to taking over, or a bonus if early completion revenues are generated, at least beyond a certain level. As a consequence, early generation revenues are sometimes shared between the parties.

Taking over

Taking over of a wind turbine requires a test run which usually lasts 240 hours and includes a full load test. Taking over can be agreed on a turbine by turbine basis, or in batches of several turbines, or on a wind farm level only. The contract must provide for solutions if, due to a delayed or defective grid connection, a test run cannot be performed when planned. In case of prolonged delays, contracts usually require a taking over without trial operation.

At least a start of the warranty period after a certain long stop date should be agreed. Commissioning and taking over procedures need to be harmonized with any applicable power purchase agreement ("PPA") and grid operator requirements. After the completion of the commissioning of the last wind turbine a park test under full load should take place. The burden of proof that the WTGs are grid code compliant should remain with the contractor until the successful completion of such park test.

The warranty period is usually 5 years from taking over or an average taking over date of the wind turbines or batches. In an average taking over date structure minimum periods for the warranty periods like e.g. 48 months need to be defined. Contractors sometimes seek to link the duration of the warranty period to the on-going effectiveness of the SMA.

Delay penalties

In addition to performance LDs, TSAs usually impose an obligation to pay delay LDs in case of late performance by the contractor. The milestones to be defined and penalized are project specific. Examples include delivery of certain design documents, interface documents, type certificates; onshore delivery of WTGs to a marshalling harbour, exceeding certain "**cycle times**" if the TSA contractor is responsible for the offshore installation of the wind turbines, and the employer provides the vessel, or delay in commissioning or taking over. The employer needs to ascertain the types of damages he would suffer in case of delays: only lost revenues, or also additional cost for installation vessels, personnel, other contractors?

The employer further has an interest duly motivating the contractor that as of the first commissioning the WTG will constantly produce electricity, e.g. by penalizing delay in taking over and requiring a pre taking over availability guarantee. The contractor will in such case require that certain early generation revenues can be set off from delay LDs. Delay LD caps are project specific but usually in a range between 15 and 25% of the contract value.

Spare parts and document escrow

The employer must ensure he has access to spare parts of any kind during the entire design or economic life of the wind turbines, i.e. for 25 years at least. Some spare parts can only be sourced from the contractor. Therefore a long term obligation to provide spare parts is usually included in the TSA.

If the contractor goes out of business, becomes insolvent or refuses to deliver spare parts, the employer needs to be in a position to have such parts produced by a third party. TSAs therefore usually contain document escrow clauses. It is agreed that documents relevant for the production of spare parts are placed into escrow with an escrow agent, and that the contractor is entitled to access such documents under certain defined conditions.

It needs to be ensured that upon start of commissioning, a first set of spare parts are available on site; the obligation to deliver a first set spare parts should therefore be included in the TSA or the SMA.

Scope of the SMA

A typical SMA covers standard services, which are covered by the agreed service fee, and extra services, which would be charged separately. Standard services comprise certain predictive, preventive and corrective maintenance services and permanent monitoring services for the maintenance and operation of the WTGs. The SMA contractor should be obliged to remedy defects under the TSA as part of the standard services. Since sometimes different limitation of liability regimes apply to defects under the TSA and SMA services, a formal assessment of the type of defect / malfunction will still often be required.

The standard services should include any work, provision of materials and documents, personnel, goods, consumables and other things and services required to keep the relevant WTGs in good condition, in safe operation and in compliance with the applicable grid code and optimize the availability of the WTGs during the term of the contract.

Foundations

Location specific design

Foundations are often designed for a specific location, based on the exact water depth and eventually further hydrological conditions and the wind turbine location. As a consequence, the foundations are not interchangeable and the definition of a certain production, delivery and installation sequence is crucial.

In addition to that, the employer is ideally entitled to instruct a change of the agreed sequence at no additional cost should this be possible and required.

Piling and noise restrictions

Monopile foundations are hammered into the sea bed. The strokes cause extreme underwater noise which can be detrimental to sea life. As a consequence, construction permits often contain certain ancillary conditions aiming at protecting the environment such as absolute noise limits and/or an obligation to scare of whales and fish prior to the start of the hammering.

Techniques were developed in order to reduce such noise (e.g. bubble curtains). For a long time, contractors were not willing to assume a responsibility for not exceeding certain noise levels. However, with the noise reduction technologies becoming more mature and reliable, this is has started to change.

Inner array and export cables

Soil risk and reasonable endeavours

As per the requirements in building permits, export and inner array cables must usually be buried at a certain laying depth below the sea bed in a certain geographic position. Such burial is required in order to protect the cable against trawl nets and anchors. However, contractors are typically not willing to accept the soil risk. As a consequence, contractors do not accept the risk of whether or not this burial depth is actually achieved at the calculated cost and without extra effort. The risk that the quality of the seabed will differ from the assumptions or that other obstructions are encountered is significant. Therefore, a contractor will normally only agree to (i) use certain laying vessels and laying / burial tools and (ii) to comply with a certain method statement based on the specific vessel and tools to be used ("**reasonable endeavours**").

In this respect, the contractor does not owe any specific result. If the laying depth required according to the legal permits could not be achieved, the contractor would only be obligated to make further efforts to meet these requirements if additional costs were reimbursed and if the construction time was extended.

Such reasonable endeavour clauses are marked practice and bankable if correctly drafted.

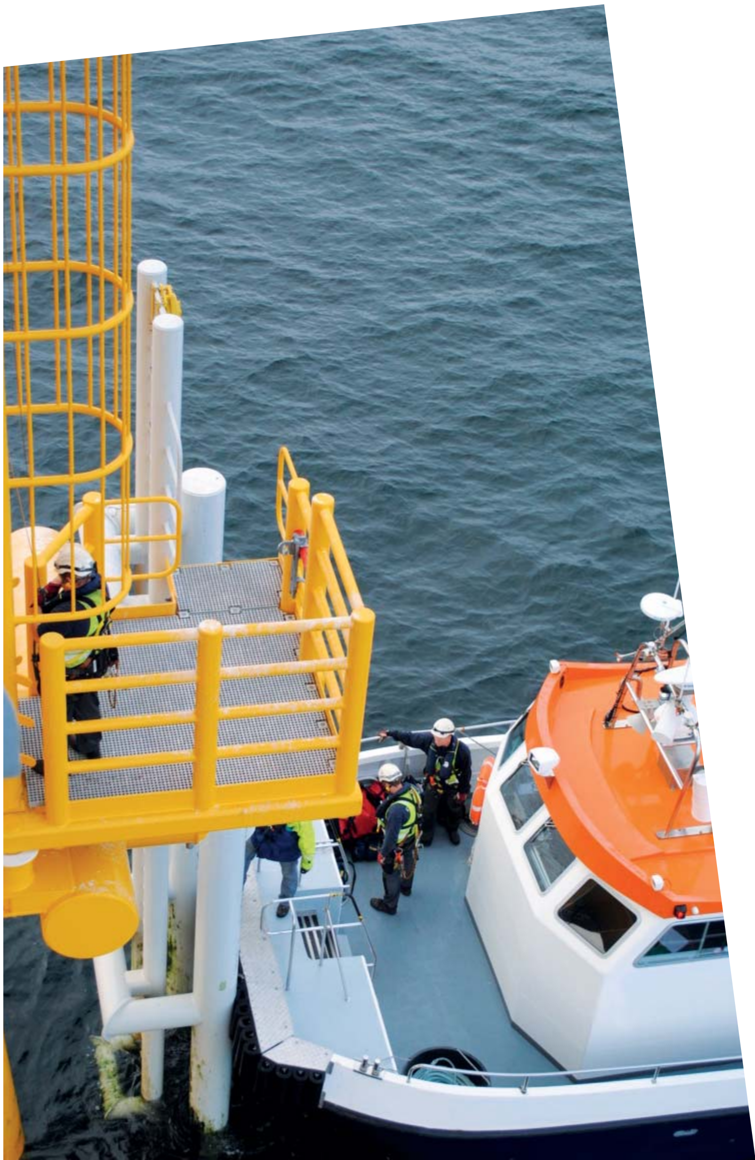
Crossings

Export cables often cross other energy or data cables or pipelines. It is standard practice to enter into crossing agreements with the owner of a pipeline or cable to be crossed before such a crossing is actually undertaken. For liability reasons, contractors usually refuse to start the work on a crossing before a duly drafted crossing agreement is validly concluded. Among other things crossing agreements contain the following:

a) Agreed design of the crossing, method statements for the works, certain information obligations;

b) A liability regime including limitations of liability to the exclusion of any further possible statutory liability with a cap on consequential loss and damage corresponding to the insurance coverage; and

c) Details on burden of proof, insurance, applicable law and dispute resolution.



Offshore substations

The design and the certification of the design of offshore substations have often delayed the offshore installation and commissioning of offshore substations in the past. Moreover, employers have often been facing severe quality problems.

Both are a consequence of offshore substations being a rather novel type of construction. There was a significant uncertainty about applicable standards, confusion caused by conflicting standards, and a general lack of established engineering practice.

This especially applied to all auxiliary systems and equipment of offshore substations including helideck, telecommunications systems and the like.

Over the last years, international standards were developed and applied successfully (DNV-OS-J201 rev. 2013).

Still it remains crucial to thoroughly define applicable standards for both design construction and for certification.

BoP contract specifics

In BoP contracts, a contractor undertakes to design, procure, transport, install and commission all required components of an offshore wind farm except for the wind turbines (i.e. cables, foundations, substations). This includes the provision of required vessels eventually including the WTG installation vessel.

In a BoP contract structure, the employer has for structural reasons less control over the project execution compared to a multi contracting structure. As a counter balancing measure the employer will therefore seek to:

a) Ensure that performance and warranty claims against the main suppliers and subcontractors to the BoP contractor are assigned by way of security to the employer or the financing banks;

b) Ensure an entitlement to partial termination of the BoP contract in case the poor performance of the BoP contractor is restricted to certain lots only;

c) Ensure that the interface with the TSA contractor is duly structured and managed; and

d) Ensure suitable control over the use of the main installation vessels and tools.

Also a BoP contract requires the careful definition of milestones to be penalized in case of delays. The levels of LD cap (e.g. 10-15%) and overall limitation of liability cap (e.g. 30-40%) in a BoP contract are typically lower than in a TSA. The BoP contractors argue that even at such lower levels the employer is much better off than in a multi contracting scenario where caps would be defined as a percentage of each single contract with much lower values.

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